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Hiroshi INOUE*: *Nardia flagelliformis* (sp. nov.), with reference to the subgeneric and sectional revision of the genus *Nardia* Gray**

井上 浩*: 新種 *Nardia flagelliformis* と *Nardia* 属の分類ノート**

A species to be described as "species nova" in the present paper was found among the collections made by Prof. H. Hara, Miss S. Kurosawa, and Dr. H. Ohashi on Mt. Singalila in 1969. The specimen was comprised of prostrating shoots, which had a superficial similarity to elongated shoots of *Poeltia* or minute-leaved *Solenostoma*. After careful studies, I found about 10 gynoecial shoots with well-developed perigynium, which revealed the species to be of *Nardia*.

In the Himalayan region, only a single, very poorly known species of *Nardia*, *N. assamica* (Steph.) Amak., has been reported (Amakawa, 1963). However, the present new species is different from *N. assamica* in 1) flagelliform habit, 2) very remotely inserted leaves, and 3) underleaves on sterile shoots nearly as large as leaves and completely free from adjacent leaves.

Nardia flagelliformis Inoue, sp. nov.

Caulis flagellifer, pallide viridis, parum ramosus, ramis intercalaribus ventralibus, raro terminalibus; folia caulina valde remota, suboblique vel subtransverse inserta, ± concava, rotundata, cauli subaequilata vel breviter latiora, oblique patula; amphigastria ± concava, oblonga vel ± trigona; cellulae foliorum medianae elongatae, 50–65 × 25–35 μ, parietibus tenuibus, trigonis nullis, cuticula laevi; dioica; perigynium erectum; perianthium profunde immersum, cellulis ori crenulati-denticulatis.

Plants very small, ± flagelliform in habit, in pale green, intricated mats, 4–8–(11) mm long; stem loosely prostrate or obliquely ascending, lower portion of shoot usually long creeping like a rhizome, pale green, fleshy, soft, variable in size, being 90–110 μ in diam. in small shoots or 150–230 μ in diam. in more well-developed shoots; cortical cells elongate, about 100–150μ long×25–34μ wide; in cross section 6–10 cells across, the cortical cells a little larger than the interior cells, 25–38×20–27μ, walls thin or±thickened, mycorrhiza infection not seen; branches not frequent, predominantly intercalary in origin (originating from underleaf axile), rarely terminal in origin

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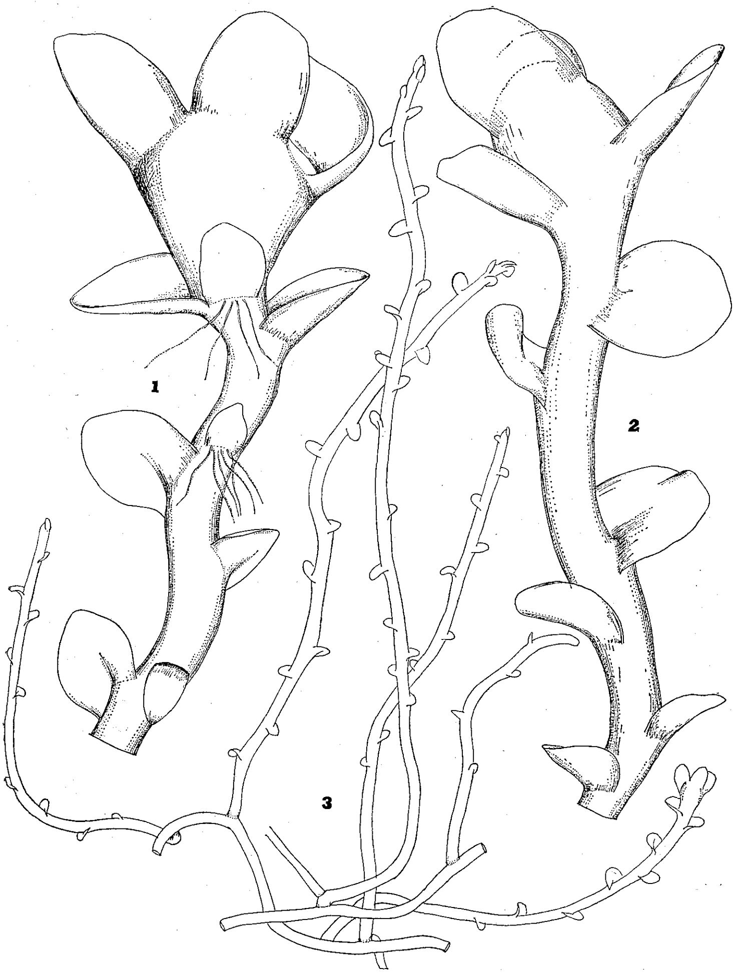

Fig. 1. *Nardia flagelliformis* Inoue. 1-2. Apical parts of gynoecial shoots, ×35. 3. Habit, ×13. All figs. based on the type.

(especially in sterile shoots) ; rhizoids restricted to underleaf-bases, fasciculate, colorless. Leaves very remotely inserted, erect or obliquely spreading, sometimes ± concave, oblong or oblong-ovate, 320–380 μ long × (200)-280-350 μ wide (widest near basal portion), insertion lines more or less oblique

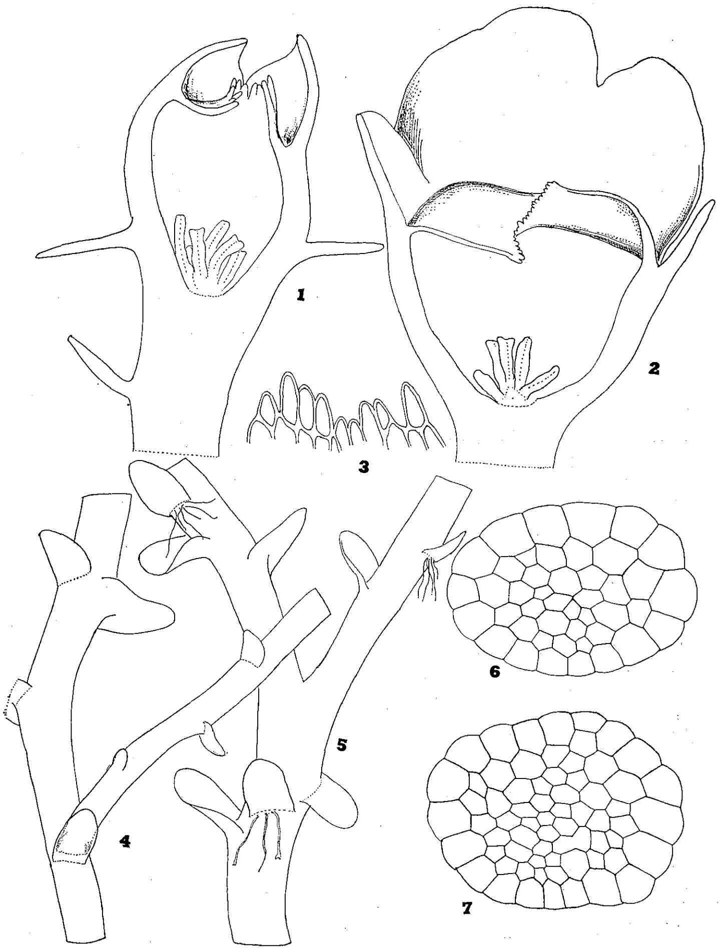

Fig. 2. *Nardia flagelliformis* Inoue. 1–2. Longitudinal sections of gynoecia, ×55. 3. Part of perianth mouth, ×150. 4. Part of shoot, with ventral intercalary branch from underleaf axil, ×35. 5. Part of shoot with terminal branch, ×35. 6–7. Cross sections of stems, ×150. All figs. based on the type.

or subtransverse, apex narrowly rounded, never retuse or bilobed except those near gynoecia where the leaf-apices are sometimes retuse or emarginate; leaf-cells at middle portion elongate, 50–65×25–35 μ, thin-walled, trigones absent, cuticle smooth. Underleaves distinct, almost as large as the leaves on sterile shoots, but those on gynoecial shoots usually smaller, transversely inserted, obliquely oriented, ±concave, oblong or ±triangular, 6–9 cells wide at the base, never connate with the leaves at base.

Gynoecia terminal on shoots, without innovation; bracts as large as or a little larger than the leaves, usually more strongly concave, apex rounded or sometimes retuse or rarely shallowly bilobed, bracteoles distinct and narrowly connate (at least at one side) with bracts at the base, 1.8–2.3 times as large as the underleaves, ovate-oblong, with rounded apex; perigynium conspicuous, very massive, fleshy, lying in axis of stem, never bulbous, as high as or up to 2 times higher than the perianth; perianth hidden within bracts and bracteole, the mouth contracted, crenulate-denticulate at margins. Androecia not seen.

Type: Darjeeling. Mt. Singalila, 3650 m. alt., leg. H. Hara et al, July 17, 1969, in hb. NICH no. 301980 (dupl. in TNS and TI).

The most closely allied species to *N. flagelliformis* seems to be *N. arnelliana* Grolle known from a high mountain of tropical Africa (Uganda). *N. arnelliana* is distinct from *N. flagelliformis* in 1) bilobed leaves (up to 1/4 the length of leaf), 2) poorly developed underleaves, and 3) thick-walled cells of stem. However, both species have many important characters in common; 1) flagelliform, obliquely ascending or loosely prostrating habit, with scarce rhizoids, 2) branching rarely terminal, 3) very remotely inserted leaves and underleaves, with insertion-lines suboblique or subtransverse, 4) small leaves nearly as wide as or little wider than the stem, 5) thin-walled leaf-cells, lacking trigones, 5) erect perigynia, and 6) perianths completely hidden within bracts and bracteole.

Grolle (1964) proposed sect. Breidlerion of the genus *Nardia*, including in it *N. breidleri* (Limpr.) Lindb. (as the type), *N. arnelliana* Grolle, and *N. unispiralis* Amak. This section was characterized by 1) bilobed leaves, with subacute lobe-apices and erect sinus, 2) leptodermous leaf-cells, without trigones, and 3) small size of leaf-cells (14–18 μ at subapical portion). Sect. Breidlerion was accepted in Schuster (1969). However, I think, this section is heterogeneous; for instance, among the species designated to this section, *N. arnelliana* is similar to *N. breidleri* and *N. unispiralis* only in bilobed leaves and small cell-size. The important characters separating *N. arnelliana* from other two species of sect. Breidlerion are 1) perigynium never bulbous, always lying in axis of stem, and 2) flagelliform shoots with very remotely inserted leaves. The branching of *N. breidleri* seems to be ventral intercalary arising from ventral merophyte, or " ventrolateral-intercalary " (Schuster, 1969). I could not observe any terminal branches in *N. breidleri* and *N. unispiralis*.

Basing on the above discussion, I would propose the following classification of the genus *Nardia* Gray.

Key to subgenera and sections

1. Plants large, erect-ascending, rigid; branches exclusively ventral intercalary; rhizoids absent (or rarely very scarce, if present); stem with a± distinct hyalodermous epidermal cells, inner cells thick-walled; leaves strongly appressed to stem (perigynium lying in axis of stem) ....Subg. Mesophylla (Dum.) Inoue ....*N. compressa*

1. Plants minute to medium in size, prostrating or obliquely ascending, soft; branches ventral intercalary or rarely terminal in origin; rhizoids numerous or few; stem without hyalodermous epidermal cells, inner cells thick- or thin-walled; leaves spreading or sometimes loosely appressed.. ..Subg. *Nardia*..2

    2. Plants very minute, usually 500 μ wide or less; leaves bilobed or narrowly rounded; leaf-cells thin-walled, without (or with very minute) trigones 3

        3. Perigynium erect, lying in axis of stem; plants flagelliform, loosely prostrate or subobliquely ascending; rhizoids very scarce; leaves very strongly remote ....Sect. Flagelliformes

        3. Perigynium with angle to stem, distinctly bulbous, rhizoidous; plants not flagelliform, rather appressedly prostrate (often with obliquely ascending apices); rhizoids numerous; leaves contiguous or moderately remote ....Sect. Breidlerion

    2. Plants small to medium in size, usually more than 700 μ wide; leaves rounded or shallowly bilobed; leaf-cells with distinct trigones 4

4. Perigynium erect; perianth usually well-developed, distinctly exserting from bracts; oil-bodies 1–(0) per leaf-cell. .Sect. Subclavatae
4. Perigynium with angle to stem or sometimes erect; perianth poorly developed, short, usually quite hidden within bracts and bracteole; oil-bodies usually 2–3 per leaf-cell ....Sect. Nardia

Subg. **Mesophylla** (Dum.) Inoue, comb. nov.

Mesophylla Dum., Comm. Bot.: 112 (1822). —— *Nardia* Gray sect. Mesophylla (Dum.) Carr., Brit. Hepat.: 10 (1874). —— *Nardia* Gray sect. Compressae Schust., Hepat. Anth. N. Amer. 2: 850 (1969). Type: *Nardia compressa* (Hook.) Gray. The type is the only species assignable to this subgenus.

Subg. **Nardia** Gray, Nat. Arr. Brit. Pl. 1: 694 (1821) [as *Nardius*]. Type: *Nardia scalaris* (Schrad.) Gray. This subgenus includes the following four sections.

Sect. **Nardia**

Nardia Gray subg. Gongylothalamus Schiffn., Denkschr. Mat. Nat. Cl. K. Akad. Wiss. Wien 67: 187 (1898). Type: *Nardia scalaris* (Schrad.) Gray. The following species other than the type are assignable to this section: *N. insecta* Lindb., *N. geoscyphos* (De Not.) Lindb., *N. geoscyphoides* Amak., *N. japonica* Steph., *N. lescurii* (Aust.) Underw., *N. hiroshii* Amak., *N. notoscyphoides* Schiffn., and *N. lindmanii* (Steph.) Schust. (?).

Sect. **Subclavatae** Inoue, sect. nov.

Perianthium plicatum, exsertum, perigynio subduplo longius, ore contracto; perigynium erectum; oleicorpora unica. Type: *Nardia subclavata* (Steph.) Amak. *N. sieboldii* (S. Lac.) Steph. and *N. assamica* (Mitt.) Amak. also belong to this section.

Sect. **Breidlerion** Grolle, Bot. Mag. Tokyo 77: 299 (1964). Type: *Nardia breidleri* (Limpr.) Lindb. *N. unispiralis* Amak. also belongs to this section.

Sect. **Flagelliformes** Inoue, sect. nov.

Planta similis facie *Poeltiae,* flagellifera, ramis raro terminalibus; folia caulina valde remota; perianthium valde imersum; perigynium erectum. Type: *Nardia flagelliformis* Inoue. *N. arnelliana* Grolle also belongs to this section.

Literature Cited

Amakawa, T. (1963) : New or little known Asiatic species of the Family Jungermanniaceae. Journ. Hattori Bot. Lab. **26** : 20–26. Grolle, R. (1964) : Eine *Nardia* aus Afrika. Bot. Mag. Tokyo **77** : 297–299. Schuster, R. M. (1969) : The Hepaticae and Anthocerotae of North America, vol. 2, 1062 pp. New York.

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1969年度におこなわれた東大ヒマラヤ調査隊の採集品の中に *Nardia* 属の新種と思われるものが1点みつかった。外観は *Poeltia* 属や, *Marsupella* 属などの細長い shoot に似ているが, よく発達したペリギニウムならびに花被の構造から, アフリカから記載された *Nardia arnelliana* に近似の新種として記載した。この新種に関連して, *Nardia* 属の分類に新らしいシステムを提唱した。

○高等植物分布資料 (72) Materials for the distribution of vascular plants in Japan (72)

○ツルソバ *Persicaria chinensis* Nakai var. *thunbergiana* Okuyama. 本州では分布も少く, 僅かに, 中国, 紀伊, 伊豆諸島に知られている。私はこれを1970年10月29日, 千葉県館山市坂足 (サカダル) の部落内に花期のものを採集した。現地はやゝ湿めりけのある所で, 草むらの一角にほゞ 6 m² にわたって繁茂している。館山在住の中山幹, 山井広両氏は以前から, この現地を知りながら, 花を見ずに不明のまゝになっていたが, 私にお知らせ下さったので漸く正体が判明した。現地は恐らく日本の北限と思うので報告する。標本は東大理学部植物学教室に納めた。

(千葉県立東葛飾高等学校　伊藤　至)

○ミヤマミミナグサとクモイミミナグサ *Cerastium schizopetalum* Maxim. var. *schizopetalum* and var. *bifidum* Takeda. 雲竜渓谷は表日光連峰の東端にある赤薙山 (標高 2,010 m) と, そのすぐ西に連なる女峰山 (標高 2,464 m) との間の爆裂火口壁に刻まれた峻谷である。渓谷は大谷川の支流である稲荷川の上流一帯で, 特に厳冬季に現われる大氷柱は壮観で, 氷の殿堂として登山家には有名である。渓谷の両岸はもろい火山岩の岩壁がそそり立ち, 夏季には落石の危険が多い場所だけに訪れる人は少なく, 日光地方での数少ない秘境として残っているところで, 従来植物相の調査もあまり行われていなかった。しかし数年来砂防工事用の道路が渓谷入口近くまで取り付けられるようになり, 非常に入りやすくなった。

筆者は壬生高等学校生物クラブOBの中山全央君 (日大農獣医学部在学) らととも